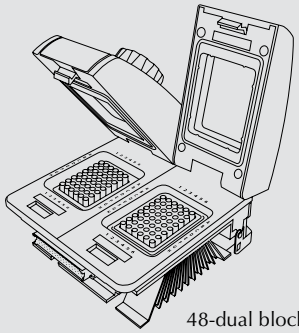
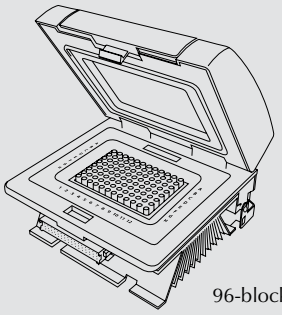
Arktik™ Thermal Cycler

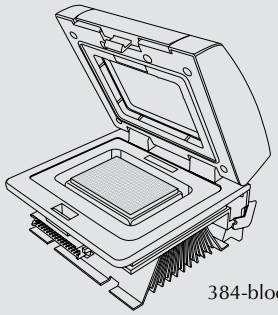
User Manual, Version 1.0



48-dual block



96-block



384-block

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TOOLS FOR MOLECULAR BIOLOGY

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1. User instructions

1.1 Safety warnings

Caution! This symbol indicates risk of harm or personal injury. Always consult the User Manual before touching the area of the Arktik™ Thermal Cycler that displays this symbol.

Caution! This symbol indicates a risk of personal injury or harm by electrical shock. Always consult the User Manual before touching the area of the Arktik Thermal Cycler that displays this symbol.

Caution! This symbol indicates risk of personal injury or burn by contact with a very hot surface. Avoid touching such surfaces.

Read the User Manual! Operating the Arktik™ Thermal Cycler without first reading the entire User Manual may constitute a risk to your health. Only a person capable of handling electrical equipment should use the Arktik™ Thermal Cycler. NOT FOR CHILDREN.

Do Not Attempt to Repair! Do not remove the cover of the system. Do not try to repair or replace broken components – you put yourself at risk for electrical shock. Removing the cover or replacing/removing components will void the warranty. Contact customer service or your local distributor if your system is not functioning properly.

Do Not Touch the Sample Block! Certain components, including the sample block and heated lid, will become excessively hot. Touching these components may cause burns.

Do Not Tamper with Electronics! Coming in contact with the electronics, even when the system is off or unplugged, may cause an electrical shock or harm.

Do Not Use Flammable or Hazardous Liquids with the Arktik Thermal Cycler!

1.2 Safe use guidelines

The Arktik™ Thermal Cycler is designed to be used safely under the following conditions:

- Indoor use
- Altitudes up to 2000 m
- Ambient, environmental temperatures between 5°C–30°C
- Up to a maximum, non-condensing humidity of 80%
- Transient over voltage per Installation Category 2, IEC664
- Pollution degree 2, in accordance with IEC664

1.2.1 Electromagnetic interference

This product conforms to the "Class A" standards for electromagnetic emissions intended for laboratory equipment applications. It is possible that emissions from this product may interfere with some sensitive appliances when placed nearby or in the same circuit as these appliances. The user should be aware of this potential risk and take appropriate measures to avoid interference.

1.3 Good laboratory practices

The polymerase Chain reaction (PCR) is an extremely sensitive assay, and therefore the risk of false positive amplification is high if precautions during sample preparation and reaction setup are not observed.

- Clean lab coats
- Clean gloves
- Clean lab benches and equipment.
- Pre-amplification areas should be separate from the amplification areas
- Pre-amplification and amplification areas should both have their dedicated lab equipment
- Open reagent component tubes only when needed
- Uncap and close tubes carefully

1.4 General chemical warnings

Chemical Hazard Some of the chemicals used with the instrument might be potentially hazardous. Before handling chemicals read through the material safety data sheets provided by the chemical manufacturer. Use protective equipment when handling hazardous chemicals. Do not inhale any fumes from chemicals. Refer to chemicals material safety data sheets for more information about storage handling and disposal.

1.5 General biohazard warnings

Biological hazard When handling biological material appropriate protective clothing is required. Many biological materials (e.g. micro organisms, cell cultures, tissues, body fluids and parasites) have the potential to transmit infectious diseases. Personnel handling biologically hazardous material should be trained beforehand.

1.6 Glossary and conventions

1.6.1 Glossary

PCR: polymerase chain reaction.
Touchdown PCR: a protocol in which time and/or temperature are changed in small increments and are added or subtracted to a step. These changes continue to progress from cycle to cycle throughout the entire loop section of the protocol.
Gradient PCR: a protocol in which the temperature across the sample block is varied column by column for a particular hold step.
UTW: Ultra-thin wall reaction vessel provided by Finnzymes Oy.

1.6.2 Typographical

All buttons on the keypad are referred to in brackets. The following is an example referring to the "shift block" button on the keypad: "press [SHIFT BLOCK] to shift between the two blocks when a dual block is inserted in the machine."

Bolded words refer to items or functions that may be selected from the programming menu. The following is an example for initiating a protocol: "To run a protocol, first select **RUN** using the function key."

2. Installation

2.1 Items included

Inside the Arktik Thermal Cycler package you should find the following:

- Arktik Thermal Cycler base unit *
- Power cord
- Two spare fuses (250 V, fast, 8A, 5x20 mm)
- Quick user guide
- User manual
- Sample pack of UTW® PCR vessels

If you have not received the above items in your shipment, please contact your local distributor or Finnzymes Oy directly. Please save all packing material in case you need to return the Arktik Thermal Cycler for maintenance.

* Required blocks sold separately

2.2 The Arktik™ Thermal Cycler set-up

Setting up the Arktik Thermal Cycler can be performed in five simple steps:

1. Remove all components from packaging.
2. Place 96-well block, 384-well block, or dual block into Arktik Thermal Cycler base unit (see section 4.1).
   Note: never lift or carry the block by handle only, always support the block from the side or underneath.
3. Plug the power cord into the back of the Arktik Thermal Cycler.
4. Insert the power cord into the outlet.
5. Turn on the power switch on back of the instrument.

2.3 Conditions for proper use

Important! It is highly recommended that all users of the Arktik Thermal Cycler read the next section carefully. The performance and the reliability of the Arktik Thermal Cycler are closely linked to the working conditions in which the system is run. To ensure that your Arktik Thermal Cycler system will provide years of top-level performance and will have the fewest problems, please adhere to the following environmental requirements:

Absolute environmental requirements – The Arktik Thermal Cycler is rated to operate reliably within the following environmental conditions. Please avoid extremes of these environmental ranges to best preserve the long-term performance and life span of the instrument.
Ambient temperature: 5°C–30°C
Ambient relative humidity: up to 80%
Altitude: under 2000 m

Recommended working conditions – The Arktik Thermal Cycler will perform optimally and exhibit highest reliability when the working conditions are as close to "standard" laboratory conditions (20°C, ambient relative humidity 40 %).

Airflow – Airflow is paramount to high-speed performance and high reliability. It is important to maintain good heat sink cooling capability. It is best to have a cool source of incoming air and an unobstructed exhaust of air. Follow these guidelines to best ensure optimum heat sink function:

Obstruction-free intake of air. Do not set on a hot surface or on laboratory bench paper. Do not slide any paper or other material under the system as this may hamper the airflow or be sucked into the system.

Obstruction-free exhaust of air. Always keep at least 10 cm of distance between the exhaust vents and any large solid object such as walls, larger instruments, or other thermal cyclers. Do not have other instruments exhaust directly at the Arktik Thermal Cycler system.

Clean the fins of the heat sink and the instrument regularly (see Section 6).

2.4 Vessels compatible with Arktik™ Thermal Cycler

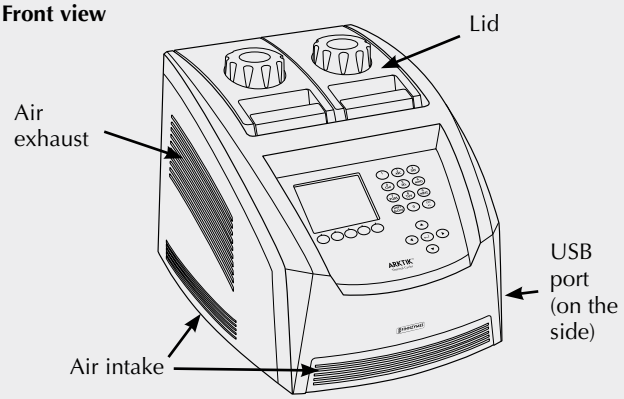
Ultra-thin wall vessels provided by Finnzymes or its affiliates are recommended. We recommend using ultra-thin wall vessels but standard vessels are also compatible. For a complete listing of product numbers, pricing, and additional product information, please visit Finnzymes' website at www.finnzymes.com.

3. Meet the Arktik™

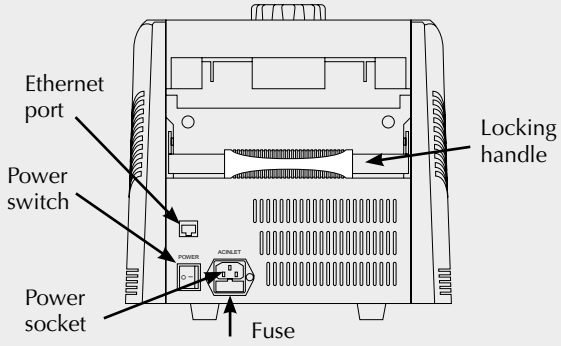
3.1 Arktik™ Thermal Cycler overview

The Arktik Thermal Cycler suits the needs of dynamic laboratory where reliability and user-friendliness are appreciated. It accommodates three interchangeable blocks – 96-block, 48-dual block and 384-block – allowing versatile use of the cycler. You control the Arktik Thermal Cycler through simple user interface. Graphical representation of a cycling routine makes navigation convenient. The USB port enables protocol transfer.

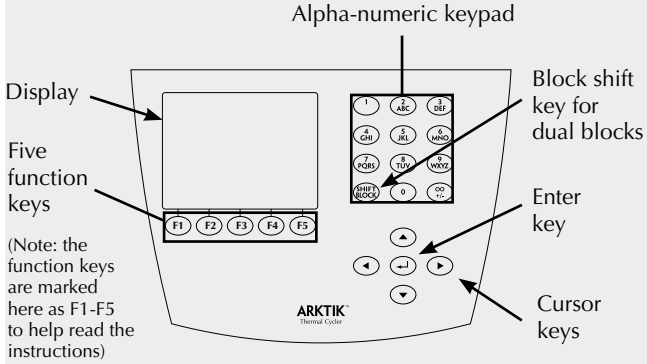
Front view



Rear view

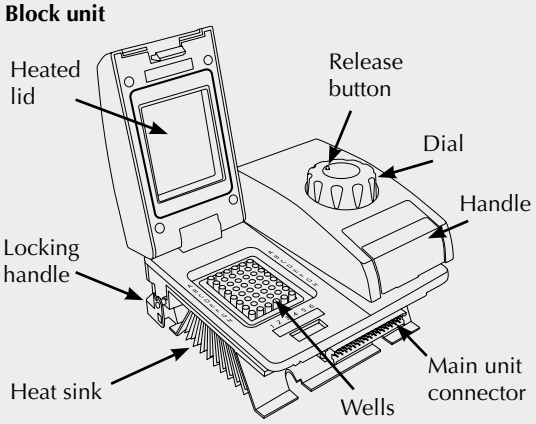


User interface

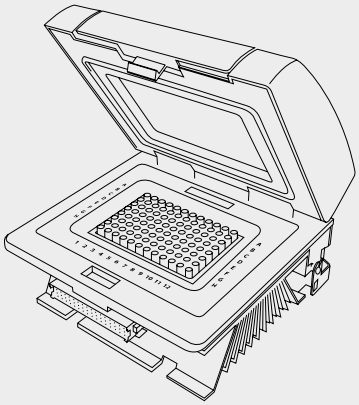


3.2 Interchangeable blocks

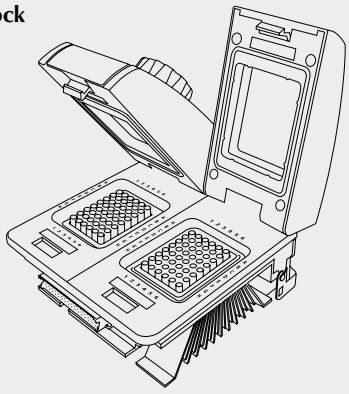
Block unit



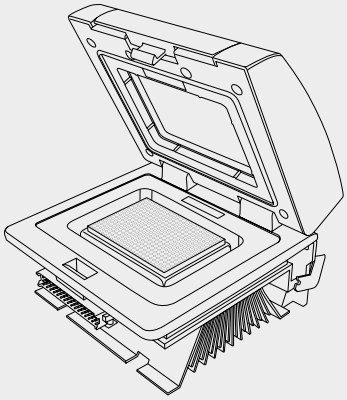
96-block



48-dual block



384-block

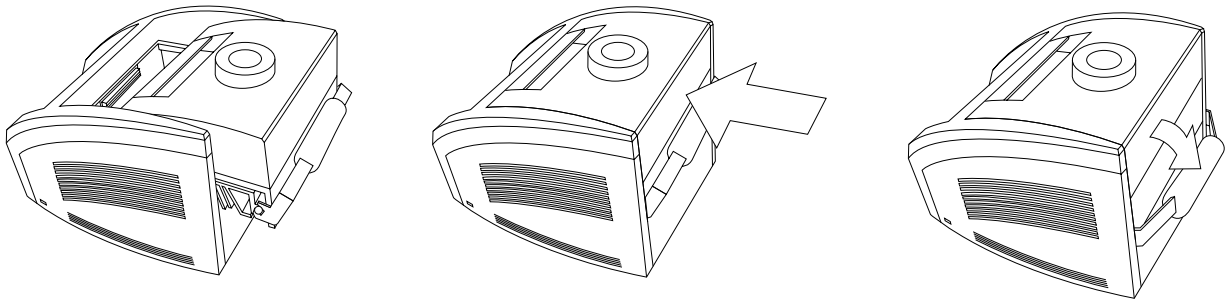


4. Operation

4.1 Installing blocks in the Arktik™ base unit

Make sure the Arktik base unit is turned off.

1. **Caution!** Do not insert or remove a block with the cycler turned on. Doing so can cause electrical arcing that can melt the contacts in the connector joining the Arktik block to the cycler.
2. Raise the handle at the back of the Arktik block and hold the block by the front and back edges. Lower the block into the Arktik base unit, leaving at least 2 cm between the front edge of the block and the front of the Arktik base unit.
   Note: never lift or carry the block by handle only, always support the block from the side or underneath.
3. Slide the block forward as far as it will go, and push the handle down. Do not use force! The block should click into place, and the handle should be completely horizontal.
4. To remove the block, lift the handle, slide the block backwards, and lift out of the base unit.



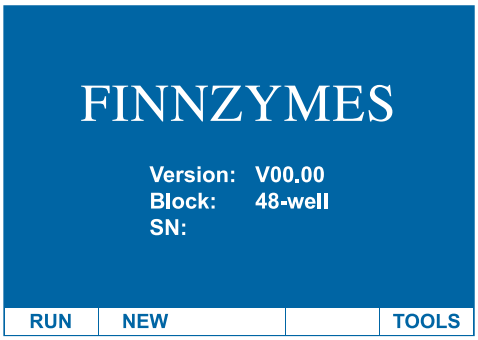
4.2 Opening and closing the Arktik™ blocks

1. To access the sample blocks, open the lid by grasping the handle and pulling it forward.
2. To close the sample block, apply downward pressure on the lid while pulling the handle forwards. To tighten lid, turn dial clockwise. To prevent over tightening, the lid mechanism will begin ratcheting when the proper pressure has been achieved.
3. To open the block after a run, first turn the dial counterclockwise to raise the heated lid, then open as in step one. Note that failure to raise the internal heated lid may result in crushing of tubes if the cycler is used with low profile tubes and subsequently used for standard profile tubes.

Note: in some case, slight expansion of the plate during thermal cycling may occur, and this may cause difficulties in opening the lid. In this case, press the release button on top of the dial down while turning the dial counterclockwise.

4.3 Main menu

The Arktik Thermal Cycler user interface features five function keys which are used to select different menu options. Note that the markings from F1 to F5 are not present in the actual user interface but instead are shown is this manual in order to help read the instructions. The function keys on the Main Menu have the following actions:



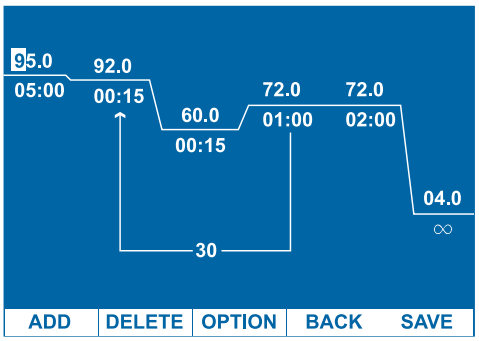
[F1] **RUN** Runs saved protocols. Allows editing of saved protocols.
[F2] **NEW** Begins programming of a new protocol.
[F3] **STATUS** Shows Status Screen (when running).
[F4] Not used.
[F5] **TOOLS** Accesses global settings or diagnostic routines.
SHIFT BLOCK. The red button with labeled "SHIFT BLOCK" shifts between the two blocks when a dual block is inserted in the machine. "A" refers to the block on the left and "B" for the block on the right.

4.4 Creating a new protocol

4.4.1 Basic protocol

From the main screen, press the **NEW** button using the second blue function key [F2]. This will bring up a DEFAULT protocol. The DEFAULT protocol is a semi-graphical representation of a typical PCR temperature cycling routine.

A temperature step is represented by a horizontal line with a temperature value (with a resolution of 0.1, in °C) above the line, and a time value (in mm:ss) below the line. If a step is highlighted, this line will flash. Use the cursor keys ([◀] and [▶]) to toggle between temperature steps.



Function key actions:
[F1] **ADD** Adds a temperature step to the right of the highlighted step or allows the addition of a **GOTO** routine (see Section 4.4.3).
[F2] **DELETE** Deletes the highlighted temperature step. Also deletes a **GOTO** routine if it is highlighted.
[F3] **OPTION** Allows the programming of advanced options into the highlighted step (temperature increment, extend time or slow ramp rate, and temperature gradient in the instruments with this feature enabled; see Section 4.4.2).
[F4] **BACK** Exits edit mode without saving.
[F5] **SAVE** Saves the protocol.

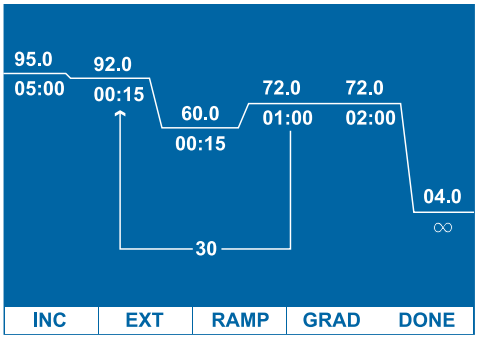
Cursor actions:
[▲] [▼] [◀] [▶] Navigate between temperature, time and cycling loop fields. Use the keypad 0–9 to edit the values.

The temperature or time value may be edited by moving the cursor to the field and then editing it directly. To enter values, use the numbers on the keypad as you would write them. The decimal point will be added automatically. For a temperature of 60.5°C, enter the following: "6, 0, 5." Similarly, for a time value, enter the numbers as you would write them: for a 1 minute and forty-five second hold, enter the following: "0, 1, 4, 5."

Note: To enter an infinite hold, press the lower right key on the keypad (with the ∞ symbol).

4.4.2 Entering advanced programming options

From the protocol editing screen, press the **OPTION** selection using the [F3] key.

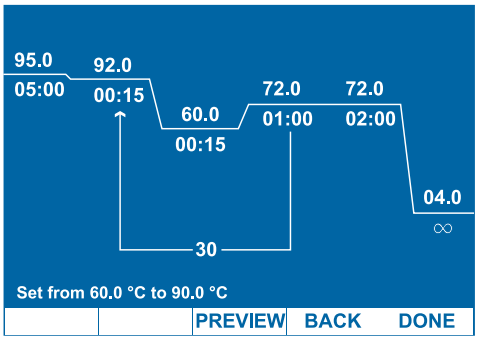


The function key actions:
[F1] **INC** Adds (or subtracts) a defined temperature increment to a temperature step, such that the amount of the increment will be added to (or subtracted from) each successive cycle. This is used for Touchdown protocols. Input range = (+/-) 0.1°C to 9.9°C per cycle.
[F2] **EXT** Adds (or subtracts) a defined time extension to a temperature step, such that the amount of the extension is added to (or subtracted from) each successive cycle. Input range = (+/-) 1 to 99 seconds per cycle.
[F3] **RAMP** Slows the ramp rate going to a highlighted step to a value below the maximum. Input range = 0.1 to 4.0°C/second.
[F4] **GRAD** set gradient (for gradient blocks only). For any hold step, it is possible to set up a horizontal temperature gradient across the block; each column of wells will have a different temperature. To program a gradient step, select this feature from the OPTION menu, and input the desired upper and lower temperatures (the maximum range is 30°C) using keypad 0–9. See Gradient setup Menu on page 10.
[F5] **DONE** Accepts advanced option values and returns to protocol editing screen.

Note: If advanced options have been entered, the OPTION menu label will be reverse displayed (have a white text) when the modified step is highlighted. This will remind the user that an option has been programmed into that step.

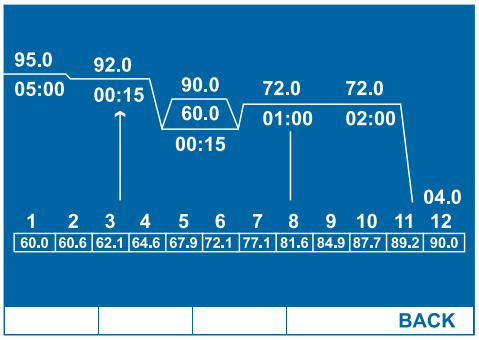
Gradient setup Menu

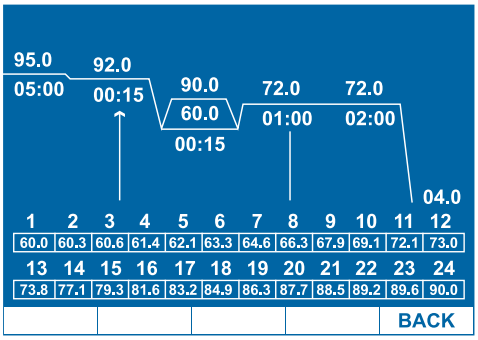
The function keys on the Gradient setup Menu have the following actions:



[F1] no function
[F2] no function
[F3] **PREVIEW**. Displays the temperature setting for each column with the given upper and lower temperatures ([F3] **back** returns to gradient setup screen).
[F4] **BACK**. Exits mode without saving.
[F5] **DONE**. Sets displayed gradient and returns to advanced programming options screen.

Previews for the 96-block and the 384-block, respectively:





The minimum gradient temperature is assigned to the far left column (column 1) of the sample block and the maximum temperature is assigned to the far right column (column 12).

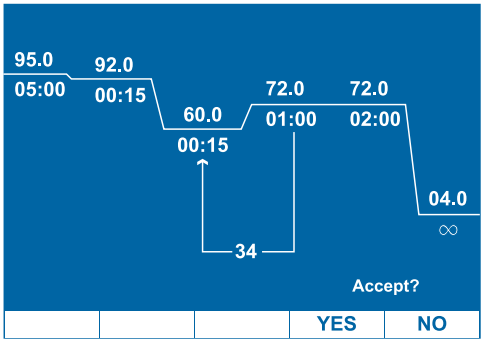
4.4.3 Editing a cycling loop

Modifying a cycling loop

In the default protocol, edit the cycling loop by hightlighting the loop. Use the [◀] [▶] cursor keys to move the arrow to a different temperature step. The number of cycles is displayed in the middle of the loop arrow, at the bottom of the screen. This value may be edited using the keypad.

Adding new cycling loop

From the protocol editing screen, with the cursor on the last step of the desired loop, press the **ADD** selection using the [F1] key. Select **GOTO** using the [F2] key.



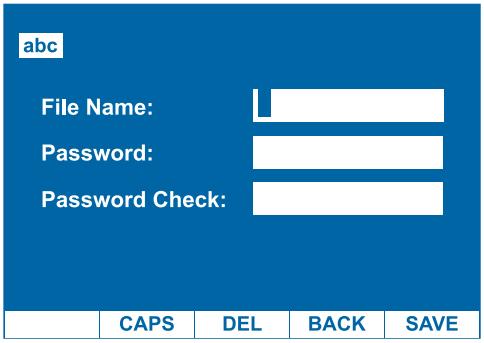
An arrow will appear that will point, by default, to the temperature step directly before the final step in the loop. Use the [◀] [▶] cursor keys to move the arrow to a different temperature step. The number of cycles is displayed in the middle of the loop arrow, at the bottom of the screen. This value may be edited using the keypad. Press the **DEL** selection [F2] to delete a cycling routine. Press the **Yes** key to accept changes, or press the **No** key to cancel and go back to the previous screen.

Function key actions:
[F1] [F2] F3] No action.
[F4] **YES** Accepts new cycle loop or edits to the cycle loop.
[F5] **NO** Cancels and returns to previous screen.
Cursor actions:
[◀] [▶] Toggles the arrow between steps to select **GOTO** destination for cycling.

Important! The GOTO value is the number of repetitions of the loop, which is 1 less than the total number of cycles. For example, to program 35 cycles, 34 repetitions should be entered into the GOTO step.
Note: A second GOTO routine can be added outside of existing GOTO routine only.

4.4.4 Saving a protocol

From the protocol editing screen, press the **SAVE** selection using the [F5] key.

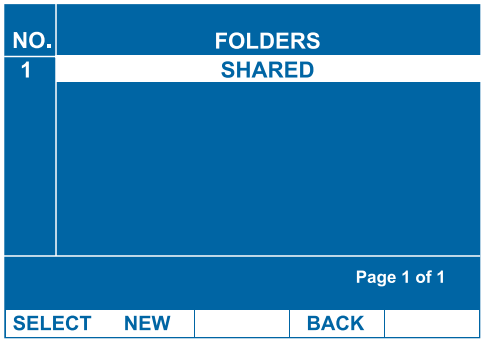


The current file name will be displayed. To save changes to current file name, press **SAVE** [F5]. To change the file name, use the keypad to rename the file, then press **SAVE** [F5].

Note: Text entry is similar to that of a mobile phone. A number or character is automatically entered after a one second delay. Pressing key will toggle through the assigned number and three characters (for example, press the key labeled [2,A,B,C,] once to select "A" and wait 1 second). For capital letters, press **CAPS** [F2]. To delete a letter, press **DEL** [F3]. A file name can be a maximum of 11 characters long. Files may be password protected by entering a password (up to 11 characters) into both the Password and Password Check fields. **Note:** the passwords in both fields must match exactly.

Press **BACK** [F4] to resume editing the protocol without saving.

Press **SAVE** [F5] to save the protocol to a folder. The screen will display the folder options.



Function key actions:

[F1] **SELECT** Selects the folder to which the protocol will be saved.

[F2] **NEW** Creates a new named folder (see Section 4.6).

[F3] No Action

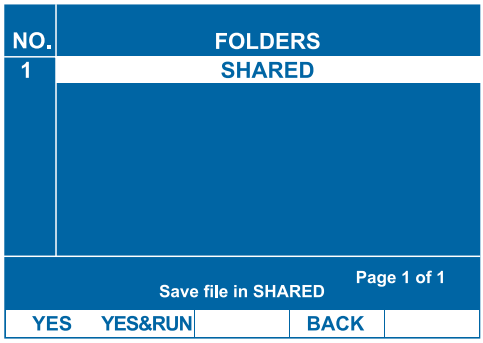
[F4] **BACK** Returns to previous screen.

[F5] No Action.

Cursor actions:

[▲] [▼] Highlights folder for selection.

Note: A protocol may not be saved to the {RECENT} folder. Before a protocol is saved to a folder, final confirmation will be presented:



Function key actions

[F1] **YES** Saves protocol file to selected folder and returns to Main Menu.

[F2] **YES&RUN** Saves protocol file to selected folder, and proceeds to the "Running a protocol" step (see Section 4.7).

[F3] No Action

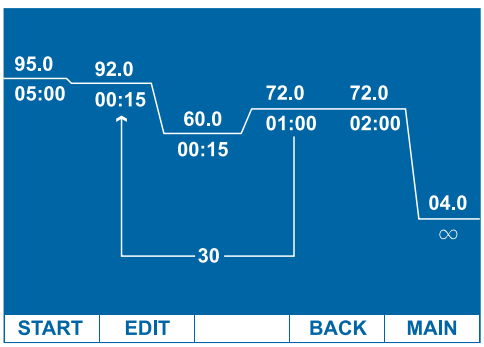
[F4] **BACK** Returns to previous screen.

[F5] No Action

Note: If a file with the same name already exists in the folder, the user will be warned and offered the choice of overwriting the file or going back to choose a different file name or folder.

4.4.5 Editing a protocol

1. From the Main Menu select **RUN** [F1].



2. Highlight a folder using the cursor keys.
3. Press **OPEN** [F1] to open the selected folder.
4. Highlight a protocol file using the cursor keys.
5. Press **OPEN** [F1] to open the selected protocol file. This will display the semi-graphical representation of the protocol.

Function key actions:

[F1] **START** Begins to run selected protocol.

[F2] **EDIT** Allows editing of the protocol in semigraphical mode.

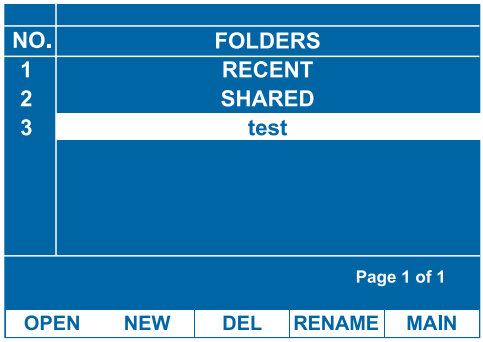
[F3] No Function

[F4] **BACK** Returns to previous screen.

[F5] **MAIN** Returns to Main Menu.

4.5 Managing folders

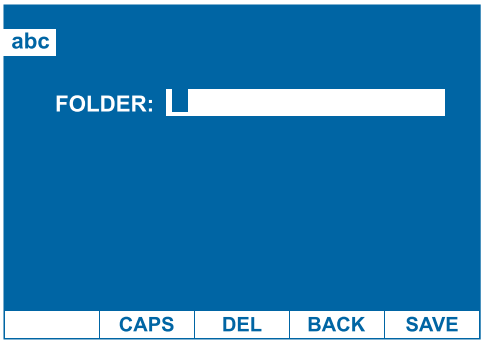
From the Main Menu, select **RUN** [F1].



Function key actions:
[F1] **OPEN** Opens a folder and displays its contents.
[F2] **NEW** Creates a new folder.
[F3] **DEL** Deletes a folder.
[F4] **RENAME** Allows renaming a folder.
[F5] **MAIN** Returns to Main Menu.

4.6 Creating a new folder

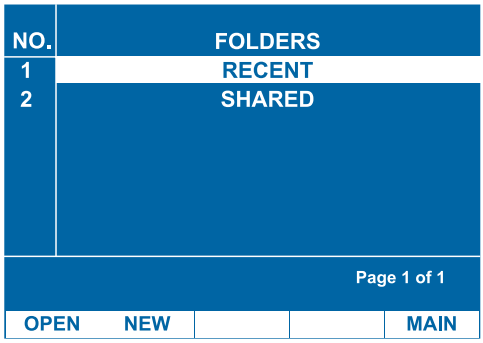
Press [F1] **RUN** to access the Managing folders selection. Press **NEW** [F2], and a prompt will appear in the folder name box. Enter the desired folder name using the keypad (11-character maximum).



Note: Text entry is similar to that of a mobile phone. A number or character is automatically entered after a one second delay. Pressing the key will toggle through the assigned number and three characters (for example, press the key labeled [2, A,B, C] once to select "A" and wait 1 second). A folder name can be a maximum of 11 characters long
Function key actions:
[F1] No function.
[F2] **CAPS** Toggles between capital and lowercase letters.
[F3] **DEL** Deletes a character.
[F4] **BACK** Returns to the folder selection screen.
[F5] **SAVE** Saves the new folder and returns to folder selection screen.

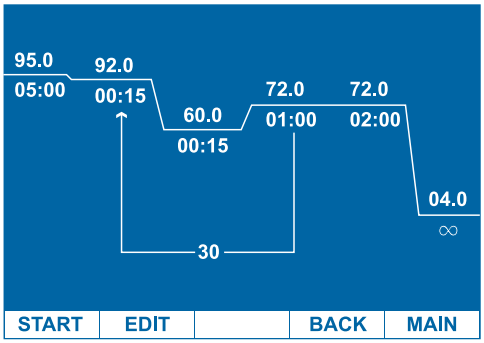
4.7 Running a protocol

From the Main Menu, press **RUN** [F1].



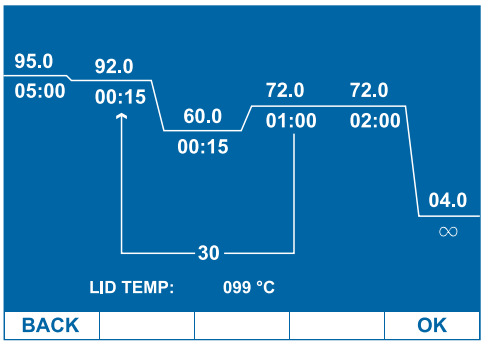
There are two permanent folders: the {RECENT} folder stores the last nine protocols that were run on the Arktik Thermal Cycler, and the {SHARED} folder can be saved to and accessed by all users.

Highlight a folder and press **OPEN** [F1]. The protocols residing in that folder will be displayed.
Highlight protocol and press **OPEN** [F1]. The protocol will be displayed in semi-graphical mode.

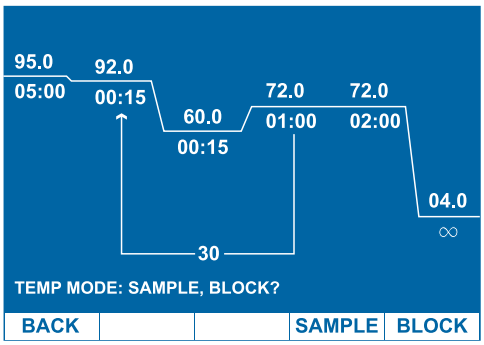


Press **START** [F1]. A lid temperature screen will be displayed, showing the default lid temperature. **Note:** the default lid temperature may be set in the TOOLS/LID menu (see section 5.1.1 for details). Lid temperatures between 30°C and 110°C are allowed.

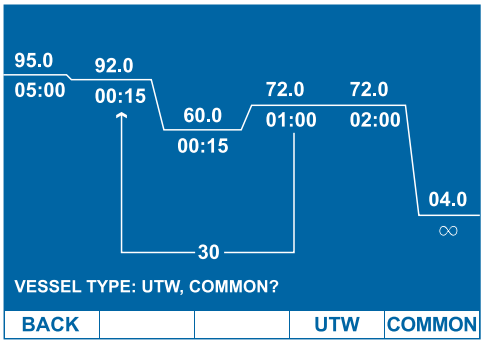
Note: The heated lid may be turned off completely by pressing the [∞] button.



Press **OK** [F5] to proceed.

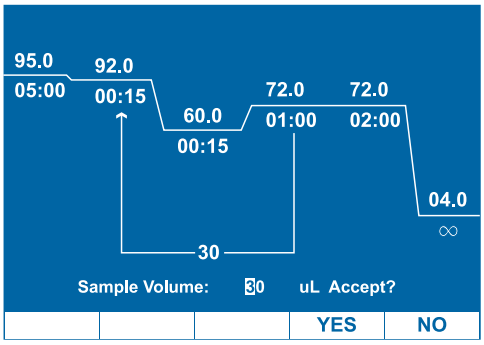


In the next screen, sample or block mode is specified by pressing **SAMPLE** [F4] or **BLOCK** [F5].
Note: Sample mode is strongly recommended for most protocols.



In the next screen, vessel type is specified by pressing **UTW** [F4] or **COMMON** [F5].

In the next screen, sample volume is specified by typing in a volume (5 to 50 µl for 48-dual and 96-blocks; 5 to 20 µl for 384-block). Confirm selection by pressing **YES** [F4] or return to vessel section screen by pressing **No** [F5].

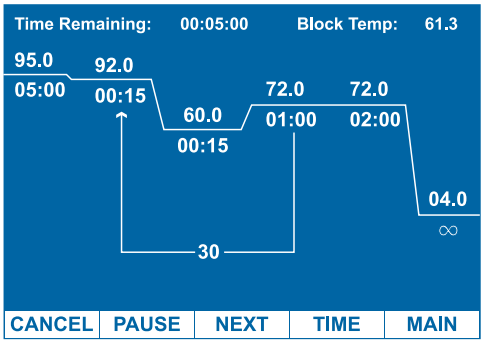


After confirming the volume, the protocol will start immediately, (see **Monitoring a Run, Section 4.8**).

Note: When a run begins, the running protocol will be displayed in semi-graphical mode on a Status Screen (see **Monitoring a Run, Section 4.8**).

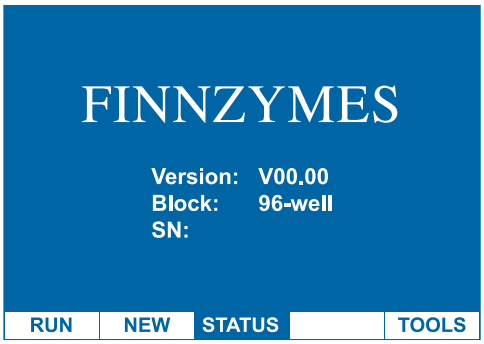
4.8 Monitoring a run

Upon initiation of a run, the Arktik Thermal Cycler will display the Status Screen.

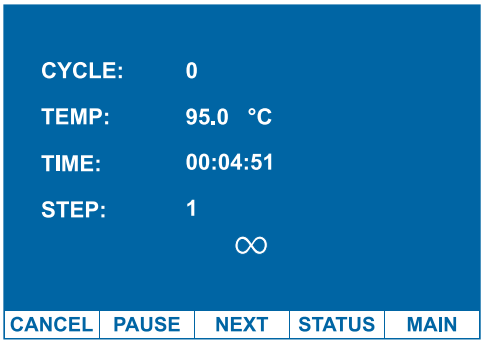


Function key actions:
[F1] **CANCEL** Terminates the run, after confirming with user.
[F2] **PAUSE** Pauses the run on the present temperature step, or next step if ramping. When paused, this option becomes **RESUME**.
[F3] **NEXT** Skips to next step.
[F4] **TIME** Toggles to the Time Status Screen.
[F5] **MAIN** Returns to the Main Menu.

Note: Returning to the Main Menu allows users to write or edit protocols while the instrument is running. A **STATUS** [F3] option will appear on the Main Menu Screen to return to the Status Screen when a protocol is running. The current running temperature step in the protocol is represented by a flashing line, and the protocol and host folders are displayed on the top of the screen. Below this are displayed the Time remaining in the current step, and the current block temperature.



Returning to the Main Menu allows users to write or edit protocols while the instrument is running. A **STATUS** [F3] option will appear on the Main Menu Screen to return to the Status Screen when a protocol is running.



Press **TIME** [F3]

The Time Status Screen displays additional information about the run. As with the Status Screen, the file name and host folders are displayed on the top of the screen. Additionally, the following status parameters are displayed:

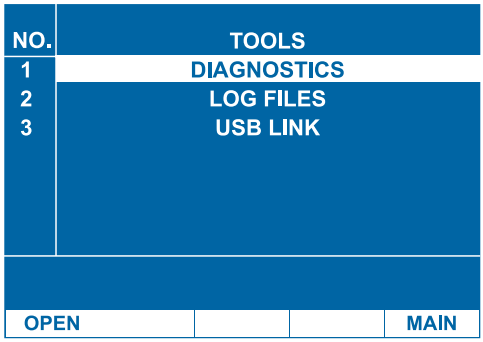
- "CYCLE": Displays the current cycle number (within a GOTO loop).
- "TEMP": Displays the current temperature of the block.
- "TIME": Displays the estimated time remaining in the current step
- "STEP": Displays the step number of the currently running temperature step.

Note: The ∞ symbol is displayed on the screen if programmed into the protocol. If not programmed into the protocol, the time left is displayed.

Function key actions:
[F1] **CANCEL** Terminates the run, after confirming with user.
[F2] **PAUSE** Pauses the run on the present temperature step, or next step if ramping. When paused, this option becomes **RESUME**.
[F3] **NEXT** Skips to next step.
[F4] **STATUS** Toggles to the Status Screen.
[F5] **MAIN** Returns to the Main Menu.

5. Managing diagnostics, log files and USB link using the Tools Menu

From the Main Menu, select **TOOLS** [F5].

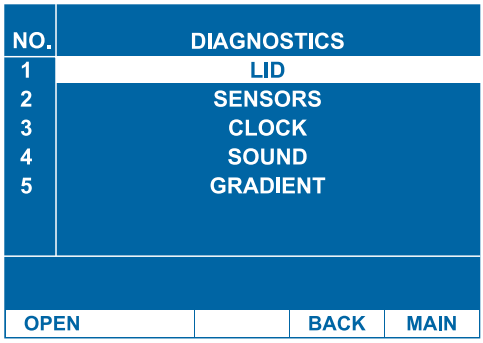


The Tools Menu provides three options which are accessed by scrolling to the desired item (using the cursor keys) and pressing the **OPEN** [F1] key:

- "DIAGNOSTICS": Allows users to check or adjust lid parameters, sensor parameters, sound settings and clock settings (see below).
- "LOG FILES": Allows users to review log files from previously run protocols.
- "USB LINK": Allows users to transfer files to or from a USB Flash device.

5.1 Diagnostics

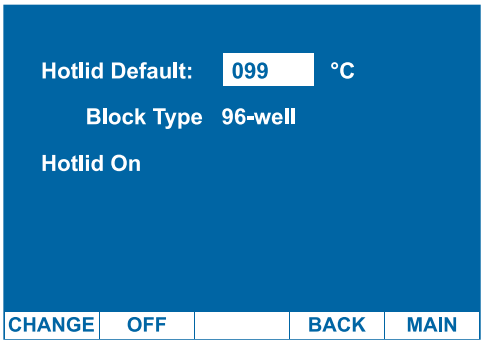
5.1.1 Lid



From the TOOLS menu, highlight "DIAGNOSTICS" and press **OPEN** [F1].

Highlight "LID" and press **OPEN** [F1].

The LID screen displays the hot lid default temperature, as well as setting determining whether the hot lid is ON or OFF by default.

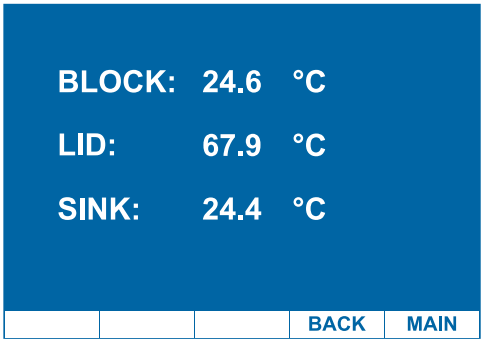


Note: These are default settings only. The user has the opportunity to change these parameters each time they begin a new run.

Function key actions:
[F1] **CHANGE** Enables the user to change the default hot lid temperature.
[F2] **OFF** Toggles the default lid setting to **OFF** (at this point, the option changes to **ON**). In order to save change to this setting, press **CHANGE**.
[F3] No Action
[F4] **BACK** Returns to previous screen.
[F5] **MAIN** Returns to main screen.

5.1.2 Sensors

Highlight "DIAGNOSTICS" and press **OPEN** [F1]. Highlight "SENSORS" and press **OPEN** [F1].



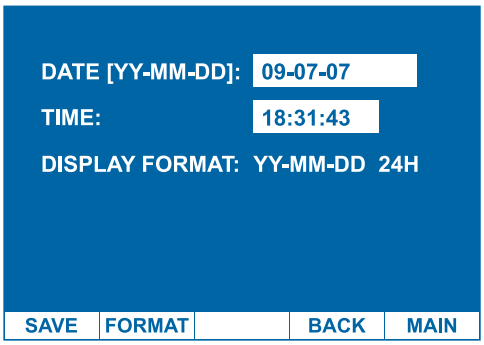
The sensors menu simply displays the current sensor reading for temperature sensors located in the lid, the block, and the heat sink.

Function key actions:
[F1], [F2], [F3] No function.
[F4] **BACK** Returns to diagnostics main screen.
[F5] **MAIN** Returns to the main screen.

5.1.3 Clock

Highlight "DIAGNOSTICS" and press **OPEN** [F1]. Highlight "CLOCK" and press **OPEN** [F1].

The clock menu allows the editing of the Arktik Thermal Cycler's internal date and time settings.

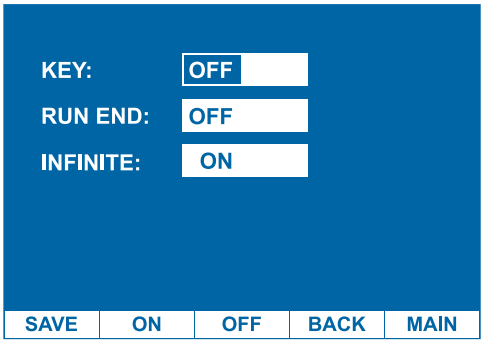


Function key actions:
[F1] **SAVE** Accepts date and time changes.
[F2] **FORMAT** change the time and date format displayed.
[F4] **BACK** Returns to previous screen, without changing date and time settings.
[F5] **MAIN** Returns to the main screen, without changing date and time settings.
Cursor key actions:
[▲] [▼] [◀] [▶] Toggles between editable fields.
Use the keypad 0–9 to insert numbers.

5.1.4 Sound

Highlight "DIAGNOSTICS" and press **OPEN** [F1]. Highlight "SOUND" and press **OPEN** [F1].

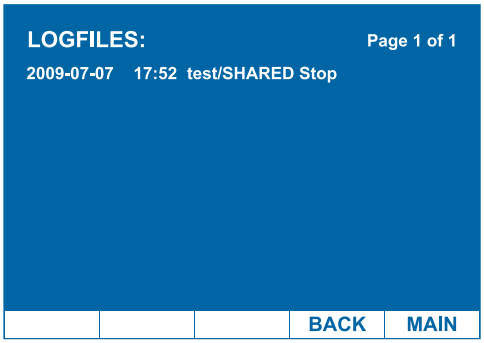
The sound menu allows the editing of the Arktik Thermal Cycler's Settings for tones produced during Keystrokes [KEY] at the end of a run [RUN END} and at the beginning of an infinite hold [INFINITE].



Function key actions:
[F1] **SAVE** Accepts sound changes.
[F2] **ON** Turns on the sound for the highlighted field.
[F3] **OFF** Turns off the sound for the highlighted field.
[F4] **BACK** Returns to diagnostics main screen, without changing date and time settings.
[F5] **MAIN** Returns to the main screen, without changing date and time settings.
Cursor key actions:
[◀] [▶] Toggles between editable fields.

5.2 Log files

From the TOOLS menu, highlight "LOG FILES" and press **OPEN** [F1]. The log files menu displays the recent protocols that were run on the Arktik Thermal Cycler. Each protocol log contains information about the protocol and possible error messages.



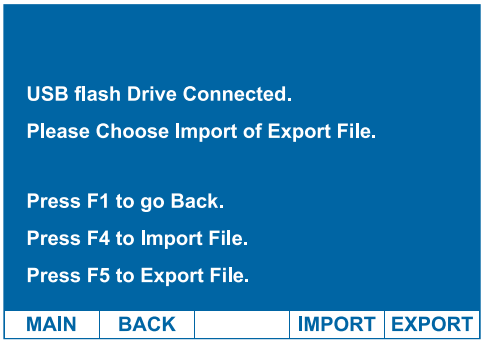
[F4] **BACK** Returns to the tools menu.
[F5] **MAIN** Returns to the main screen.

Cursor key actions:
[◀] [▶] Toggles between pages.

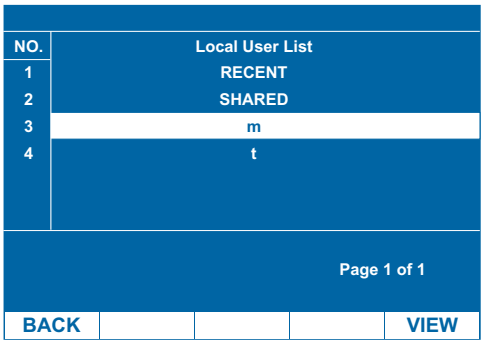
5.3 USB link

5.3.1 Exporting a file to a USB flash drive

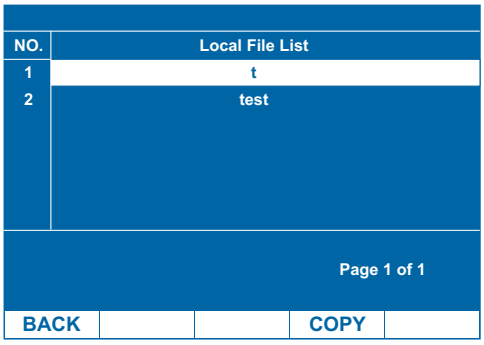
Note: Files are always transferred with the folder in which they exist. If a file is transferred to or from a USB drive, and its folder does not already exist in that location, the folder will be automatically created.



Insert USB flash drive. From the TOOLS menu, highlight "USB LINK" and press **OPEN** [F1]. Then select [F5] **EXPORT.**



Navigate to the desired File and Folder and press [F5] **VIEW**.

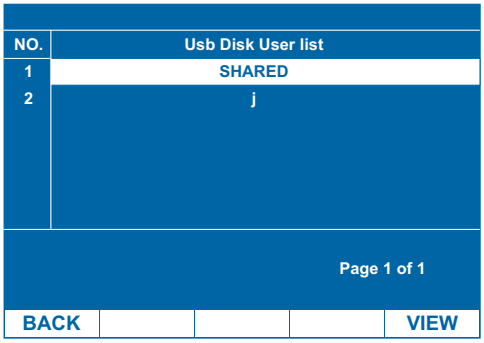


To export the selected file, press [F4] **COPY.**
Note: A message will be displayed if the same Folder/file already exists on the USB drive, giving the option to overwrite the existing file).

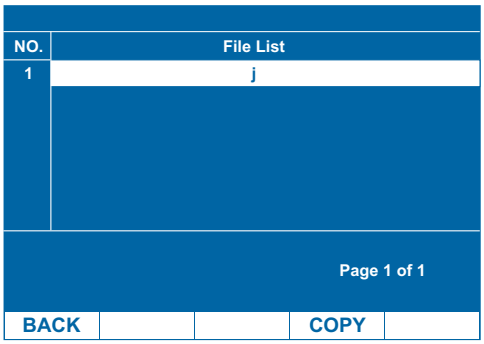
When transfer is complete, "FILE SAVED" message will be displayed. Press [F1] **BACK** key to transfer additional files to the USB drive, or [F5] to return to the main screen.

5.3.2 Importing a file from a USB flash drive

Insert USB flash drive. From the TOOLS menu, highlight "USB LINK" and press **OPEN** [F1]. Then select [F4] **IMPORT.**



Navigate to the desired File and Folder and press [F5] **VIEW.**

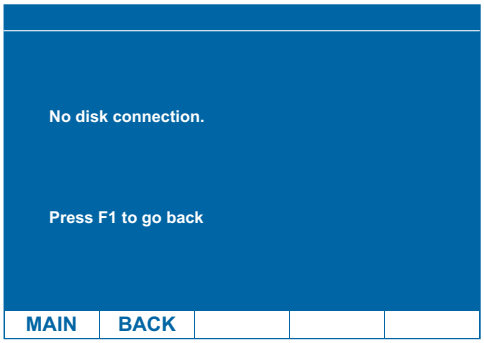


To import the selected file, press [F4] **COPY**.

Note: A message will be displayed if the same folder/file already exists on the Arktik, giving the option to overwrite the existing file).

When transfer is complete, "FILE SAVED" message will be displayed.
Press [F1] **BACK** key to transfer additional files from the USB drive, or [F5] to return to the main screen.

Note: If USB flash drive is not inserted, "NO DISK CONNECTION" message will be displayed:



6. Maintenance of the instrument

Cleaning the fins of heat sink. Inspect the fins of the heat sink on a regular basis. Dirty heat sinks have a significantly lower capacity to eject heat. Please clean the fins if they become dirty or covered in dust. You can use a cotton swab, a brush, or compressed air to remove dust.

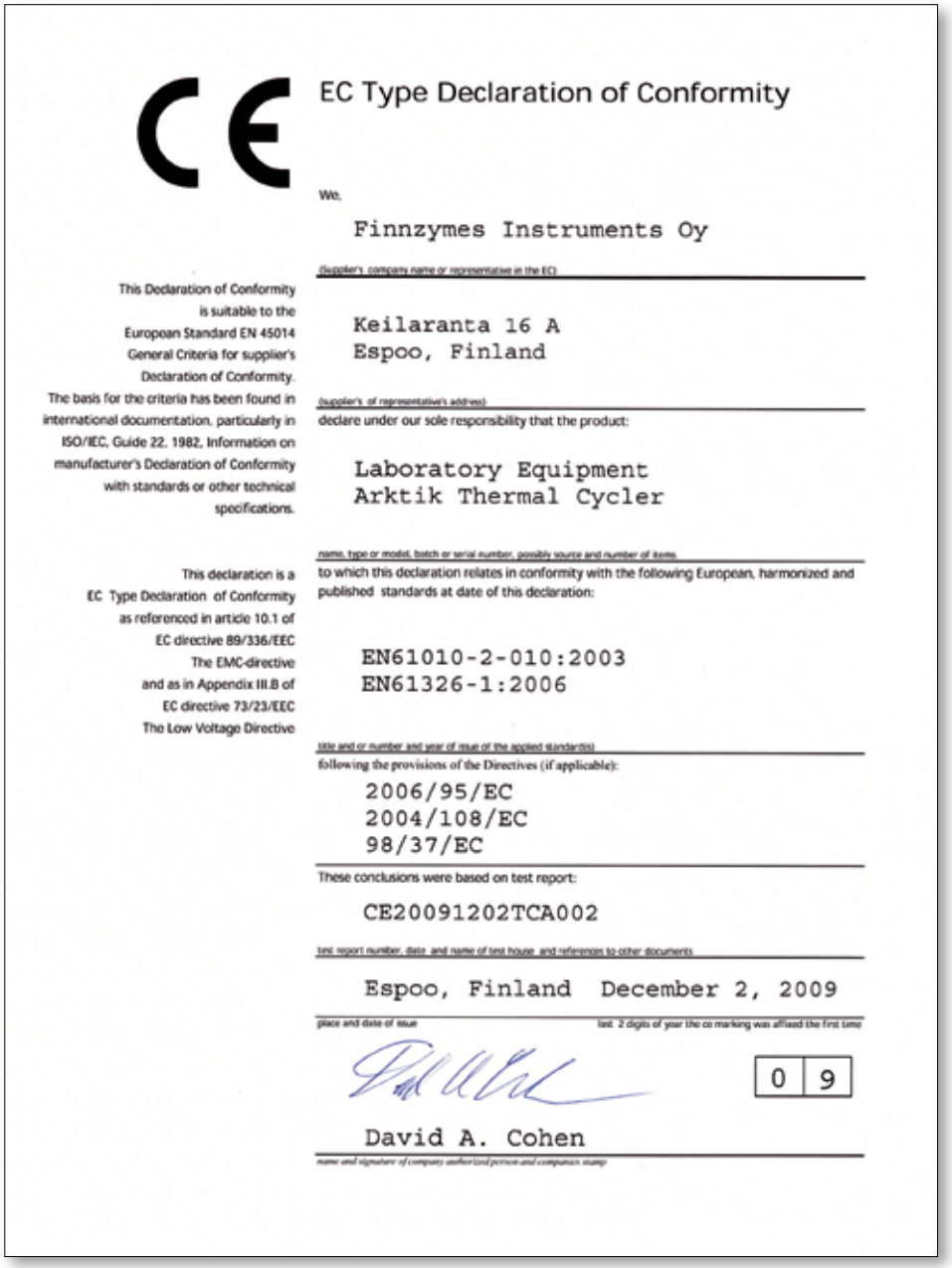
Cleaning the Arktik Thermal Cycler. Clean the outside of the Arktik Thermal Cycler with a damp, soft cloth or tissue whenever something has been spilled on it or the cover is dusty. A mild soap solution may be used if needed. Clean block wells with swabs moistened with water, 95% ethanol, or a 1:100 dilution of bleach in water.

Replacing the fuse(s). You will need the new fuse(s) (250 V, 8A, fast, 5x20 mm) and a slotted screwdriver. First, turn the instrument off and unplug it. The fuses are located at the back of the instrument (see "Rear view" in Chapter 3.1). Use the slotted screwdriver to open the fuse holder. Remove the fuse(s) and replace it with the new one. Slide the fuse holder back into the instrument. Plug in the instrument and turn it on.

Appendix

Certifications

CE – The Arktik Thermal Cycler meets all of the requirements for electronic equipment as needed to obtain Certification from the European Union.



CE

EC Type Declaration of Conformity

We,

Finnzymes Instruments Oy

(Supplier's company name or representative in the EC)

This Declaration of Conformity is suitable to the European Standard EN 45014 General Criteria for supplier's Declaration of Conformity. The basis for the criteria has been found in international documentation, particularly in ISO/IEC, Guide 22, 1982, Information on manufacturer's Declaration of Conformity with standards or other technical specifications.

Keilaranta 16 A
Espoo, Finland

(supplier's of representative's address)

declare under our sole responsibility that the product:

Laboratory Equipment
Arktik Thermal Cycler

name, type or model, batch or serial number, possibly source and number of items

This declaration is a EC Type Declaration of Conformity as referenced in article 10.1 of EC directive 89/336/EEC The EMC-directive and as in Appendix III.B of EC directive 73/23/EEC The Low Voltage Directive

to which this declaration relates in conformity with the following European, harmonized and published standards at date of this declaration:

EN61010-2-010:2003
EN61326-1:2006

title and or number and year of issue of the applied standard(s)

following the provisions of the Directives (if applicable):

2006/95/EC
2004/108/EC
98/37/EC

These conclusions were based on test report:

CE20091202TCA002

test report number, date and name of test house and references to other documents

Espoo, Finland December 2, 2009

place and date of issue

last 2 digits of year the ce marking was affixed the first time

0 9

David A. Cohen

name and signature of company authorized person and companies stamp

Instrument specifications

Instrument Configuration	
Interchangeable Block Formats:	96 x 0.2 ml, 384 x 0.03 ml, dual independent 48 x 0.2 ml
User Interface:	Semi-graphical
Heated Lid:	Manually adjustable, advanced lid design ensures proper pressure while preventing over-tightening
Memory:	50 folders with 99 programs in each
Communications:	Ethernet, USB memory port for protocol transfer
Programming	
Adjustable Ramp Rate:	Yes
Touchdown:	Yes
Thermal Control:	Optimized for standard and UTW vessels
Thermal Performance	
Ramp Rate:	2.5°C/s
Gradient Range:	30°C max.
Thermal Uniformity:	+/- 0.4°C
Thermal Accuracy:	+/- 0.3°C
Thermal Range:	4°C to 99.9°C
Dimensions	
Size:	29 cm wide, 38 cm deep, 29 cm high
Weight:	10.5 kg (includes block)
Electrical	
Power Supply:	600W
Line Voltage:	100 – 240 VAC
Frequency:	50 – 60 Hz
Power failure recovery:	Yes
Fuses:	2 x 250 V F8A
Certifications	CE
Warranty	1 year

Error log

If an Error message appears in the display window of the Arktik Thermal Cycler, it may indicate that the system cannot complete the requested action (e.g., "Heatsink temperature is too high."). Should you receive an Error message regarding block sensors, please contact Finnzymes for support.

BLOCK SENSOR ERROR:	SUGGESTED ACTION:
Single block (96G, 384G)	
Heatsink temperature is too high.	Ensure that airflow is unobstructed (see Section 2.3)
Heatsink temperature is too low.	Do not run instrument immediately if it has been stored in a cold location. Allow to warm to room temperature before operation.
Temperature sensor No. 1 is disconnected. (block left temperature sensor)	Contact Finnzymes
Temperature sensor No. 1 is shorted.	Contact Finnzymes
Temperature sensor No. 2 is disconnected. (block mid temperature sensor)	Contact Finnzymes
Temperature sensor No. 2 is shorted.	Contact Finnzymes
Temperature sensor No. 3 is disconnected. (block right temperature sensor)	Contact Finnzymes
Temperature sensor No. 3 is shorted.	Contact Finnzymes
Hotlid sensor is disconnected.	Contact Finnzymes
Hotlid sensor is shorted.	Contact Finnzymes
Dual block (48D)	
Heatsink temperature is too high.	Ensure that airflow is unobstructed (see Section 2.3)
Heatsink temperature is too low.	Do not run instrument immediately if it has been stored in a cold location. Allow to warm to room temperature before operation. If not working, contact Finnzymes for support.
Temperature sensor is disconnected.	Contact Finnzymes
Temperature sensor is shorted.	Contact Finnzymes
Hotlid sensor is disconnected.	Contact Finnzymes
Hotlid sensor is shorted.	Contact Finnzymes
USB INPUT/OUTPUT ERROR:	
File Input error.	Disconnect USB stick, go back to the Main screen, attach USB drive and try again. If not working, contact Finnzymes for support.
File Output error.	Confirm that there is enough free space on the USB drive. Disconnect USB stick, go back to the Main screen, attach USB drive and try again. If not working, contact Finnzymes for support.
MEMORY ERROR:	
Memory is full.	Delete older protocols or back them up into a USB drive and then delete the protocols.
FILE FIND ERROR:	
File not found.	Protocol is corrupted or removed. Try again or create a new protocol.

Warranty

Finnzymes Instruments Oy warrants that the Arktik™ Thermal Cycler is free from defects in materials and workmanship for 1 year from the date of purchase. Defects that are covered by this warranty and that occur during this warranty period will be repaired, or the system will be replaced, free of charge and at the sole discretion of Finnzymes Instruments Oy or its licensed distributors. Repairs that occur outside this warranty period will be charged for parts, labor and shipping. Fulfillment of warranty obligations is the responsibility of the company that sold the Arktik Thermal Cycler. For specific information regarding warranty coverage please contact said company directly.

This warranty shall not apply to any of the following:

1. Defects caused by repairs or modifications made by anyone other than Finnzymes Instruments Oy or its licensed distributors.
2. Defects caused by improper packaging of returned goods. If necessary, please contact the company that sold the Arktik Thermal Cycler to receive new shipping materials prior to shipment and instructions for proper shipment.
3. Defects caused by use of improper materials, including tubes, plates or sealers not designed and approved for the Arktik Thermal Cycler, or solvents and agents (such as radioactivity or biohazardous agents) not approved for use or allowable for public shipment.
4. Defects caused by negligence, accidents, unreasonable or improper use, natural disasters, or by other causes unrelated to defective materials or workmanship.

Notice to Purchaser

Purchase of this instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real-time thermal cycler patents of Applera Corporation.

Legal Notice

Finnzymes Instruments Oy or its licensed distributors are not responsible for any injury or damage caused by using this instrument for any purpose other than that for which it is intended, or by modifications made to the instrument that are not performed by Finnzymes Instruments Oy or its licensed distributors.

Trademark information

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FINNZYMES
TOOLS FOR MOLECULAR BIOLOGY

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